

The Rise of K-12 Blended Learning

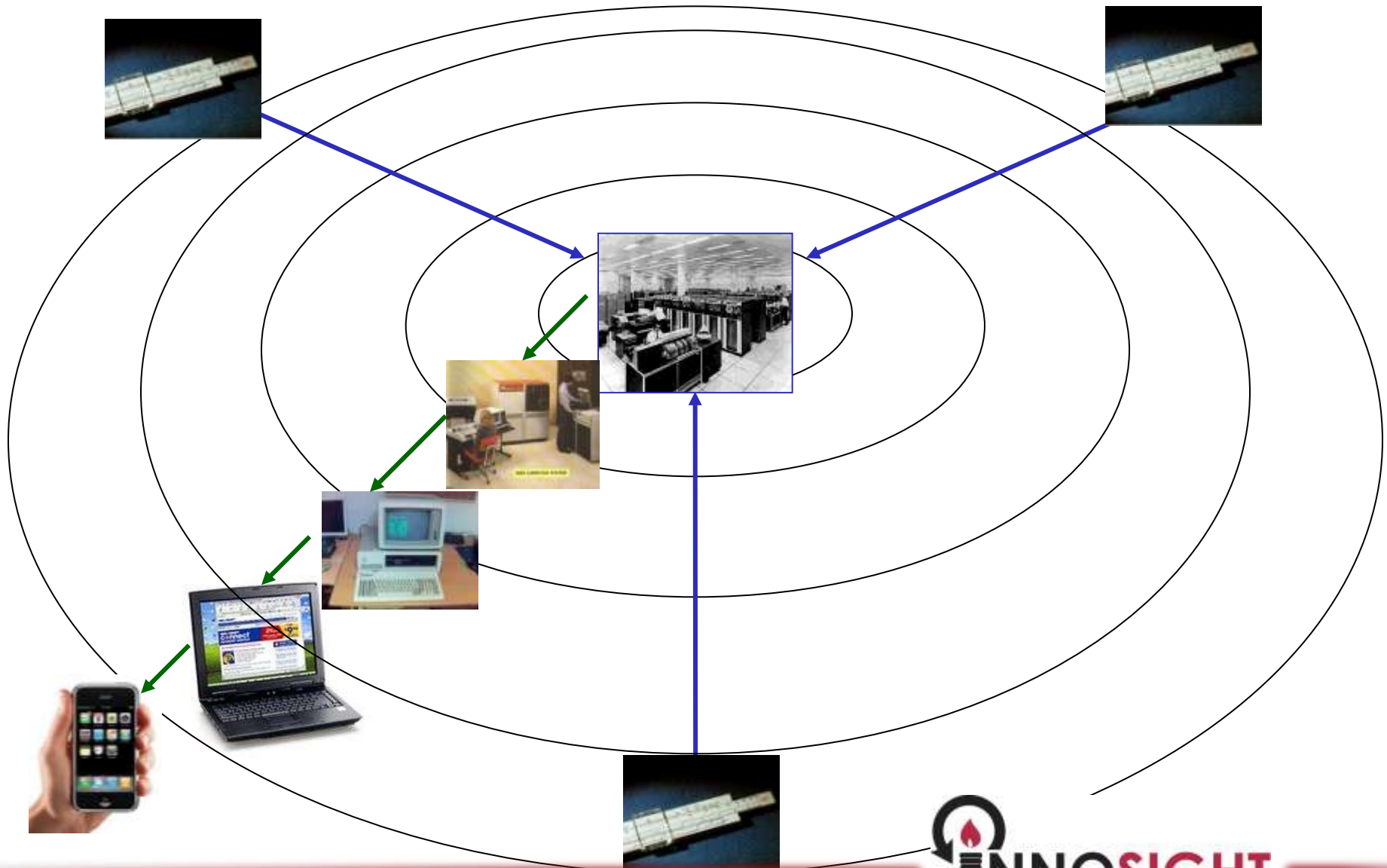
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Disruptive innovations



Disruption = affordability, accessibility

Yesterday

- GM
- Dept. Stores
- State universities
- Digital Eqpt.
- Delta
- JP Morgan
- Xerox
- IBM
- Cullinet
- AT&T
- Sony DiskMan

Today

- Toyota
- Wal-Mart
- Community colleges
- Dell
- Southwest Airlines
- Fidelity
- Canon
- Microsoft
- Oracle
- Cingular
- Apple iPod

Disruption of Toyota

Think About It

ISN'T IT TIME SOMEONE DID TO LEXUS WHAT LEXUS DID TO MERCEDES?

Narrower gaps between body panels,¹ better mileage² and roomier than the Lexus LS 460.¹

The new Hyundai Genesis is our first luxury car, and believe it or not, it's about to give the market its biggest shake-up since 1989.

The Genesis will take you from zero to 60 in a head-spinning 5.7 seconds³—and has more horsepower per liter than a Lexus GS 460.⁴ Imagine producing that much power while still getting better mileage than any car in its class.²

Impeccable details abound. Example: gaps between body panels are tighter than those found on the standard-bearer for tight tolerances, the Lexus LS 460.¹

And the Genesis cabin is among the quietest and most spacious available. It's equipped with a Lexicon® 7.1 discrete surround sound system⁵ (shared only with the Rolls-Royce Phantom). And puts you in a driver's seat that is cooled for summertime, heated for winter.

In a luxury car, there's no such thing as getting too comfortable. Although—don't say



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Tomorrow

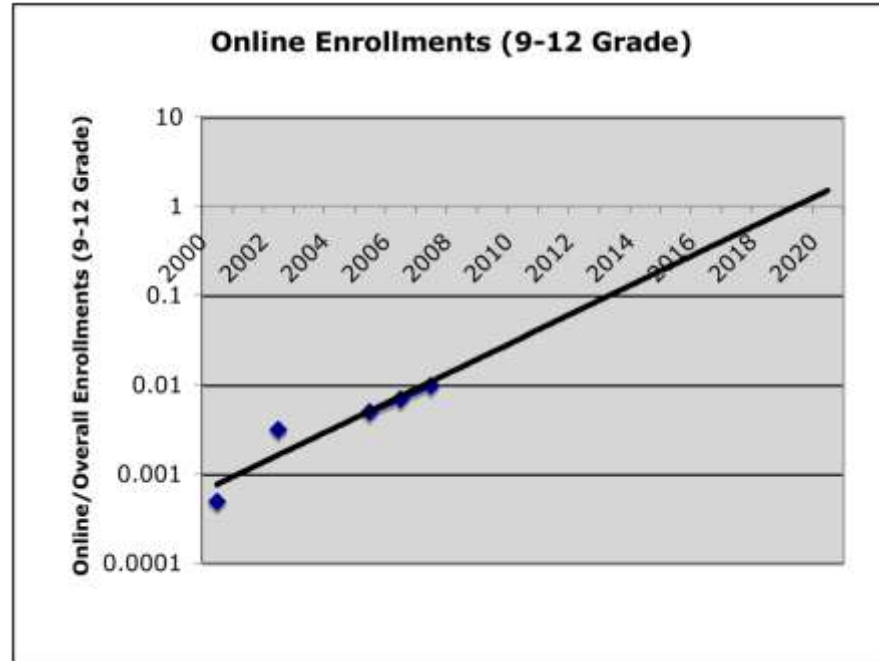
- Chery
- Internet retail
- Online universities
- RIM Blackberry
- Air taxis
- ETFs
- Zink
- Linux
- Salesforce.com
- Skype
- Cell Phones

Prime examples of nonconsumption

- Credit recovery
- Drop outs
- AP/advanced courses
- Scheduling conflicts
- Home-schooled and homebound students
- Small, rural, urban schools
- Unit recovery
- Disaster preparedness
- Tutoring
- Professional development
- Pre-K
- After school
- In the home
- Incarcerated youth
- In-school suspension
- School bus commute
- Summer school
- Teacher absenteeism
- Migrant worker families

*Looming budget cuts and teacher shortages are an opportunity,
not a threat*

Online learning gaining adoption



- *Over 4M K-12 students doing online learning, says Ambient Insight*
- *30% of high school students & 19% middle school students, says Project Tomorrow*

Technology predictably improves



Definition of blended learning

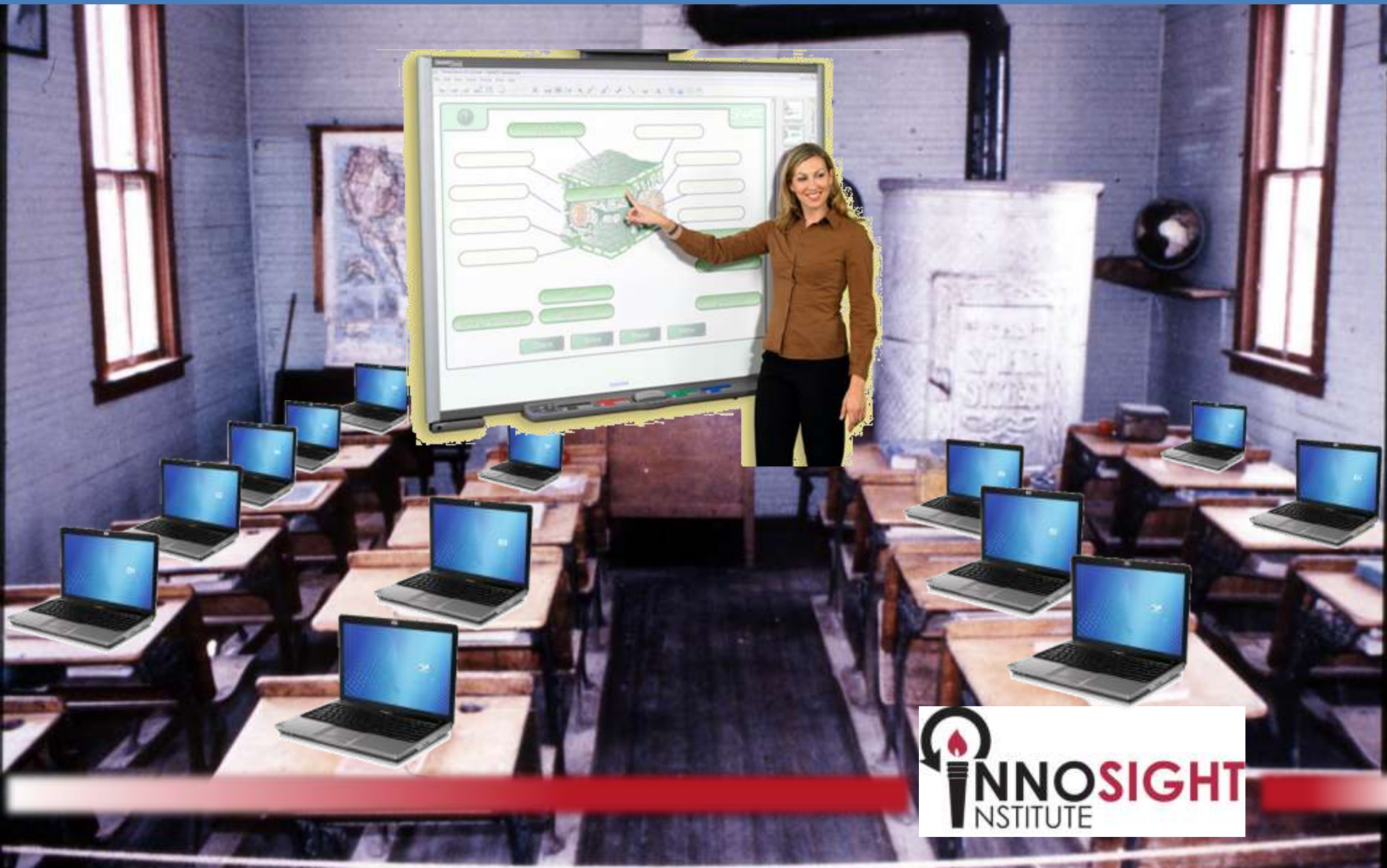
Any time a student learns in part through online delivery,
with some element of student control over time, place, path
and/or pace

and

At least in part in a supervised brick-and-mortar place away
from home

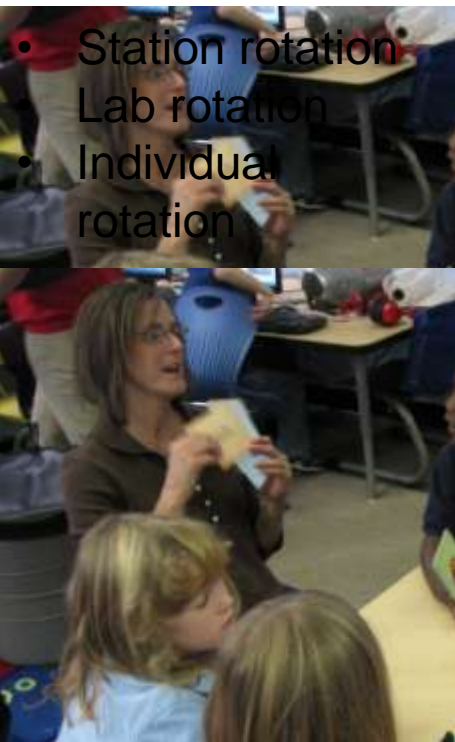


Blended learning is not...



Emerging blended-learning models

Rotation



Flex



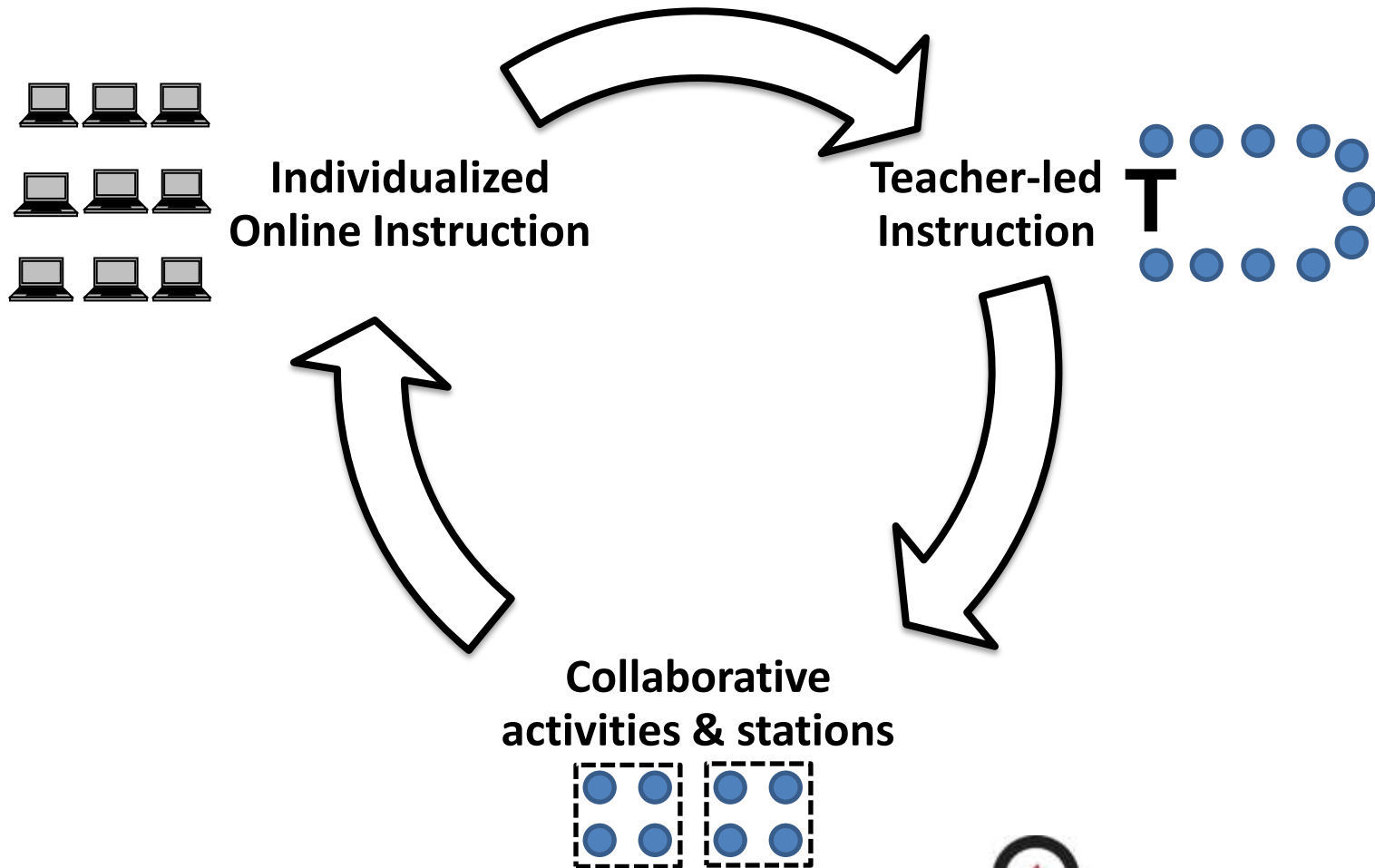
Self-Blend



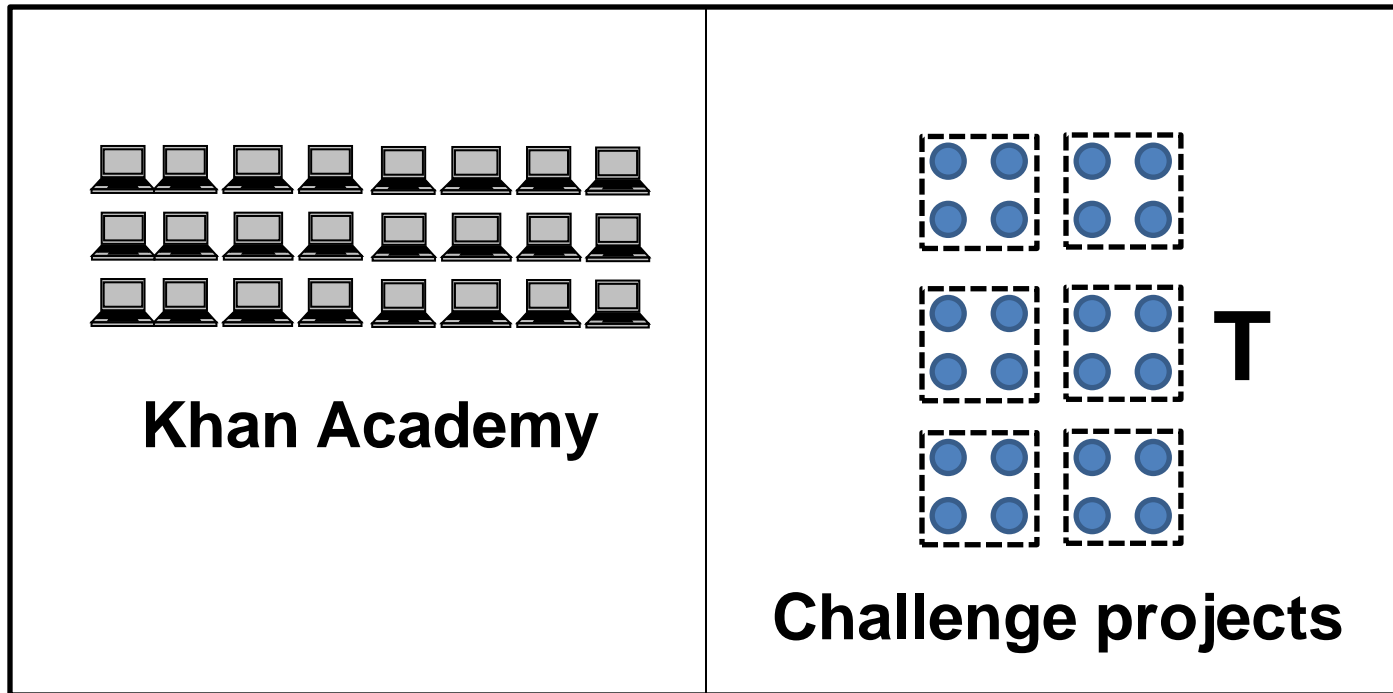
Mixed Virtual



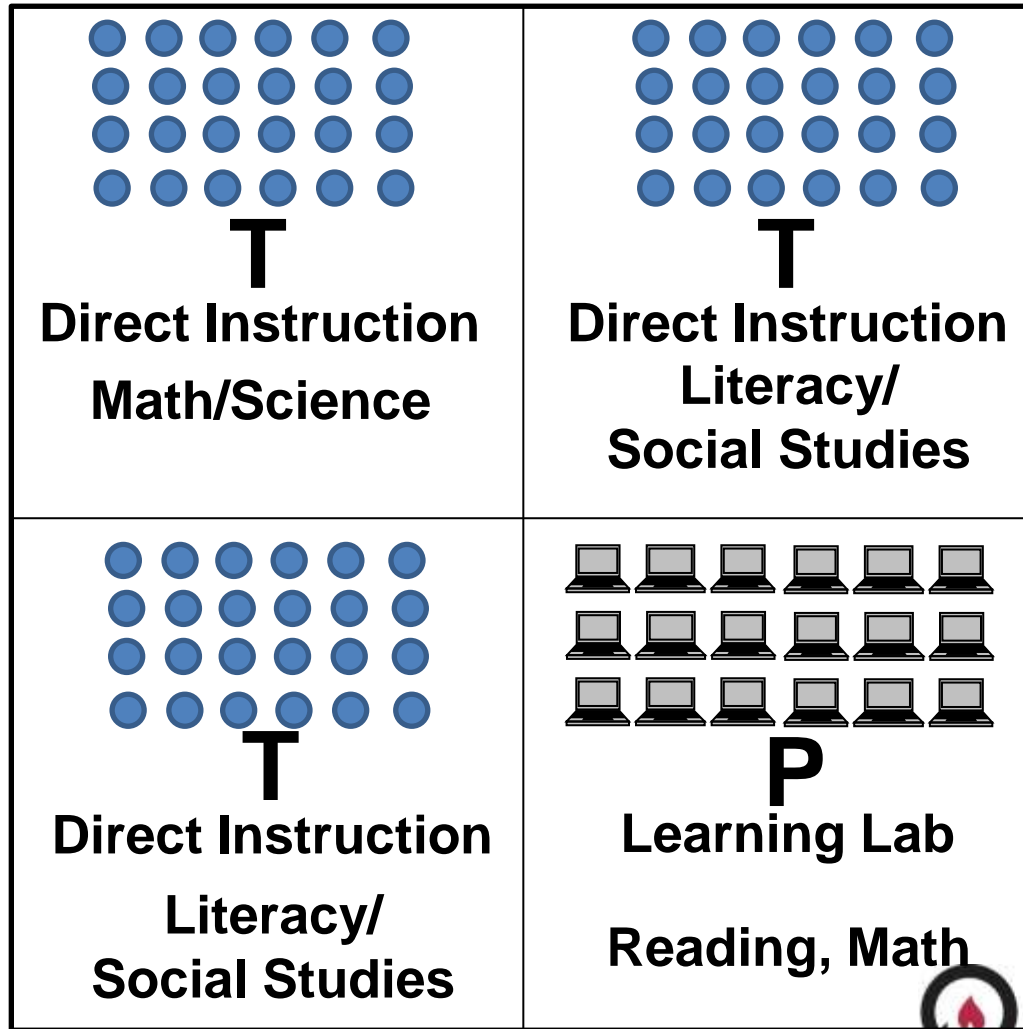
Station-rotation model: KIPP Empower



Station-rotation model: Summit Public Schools



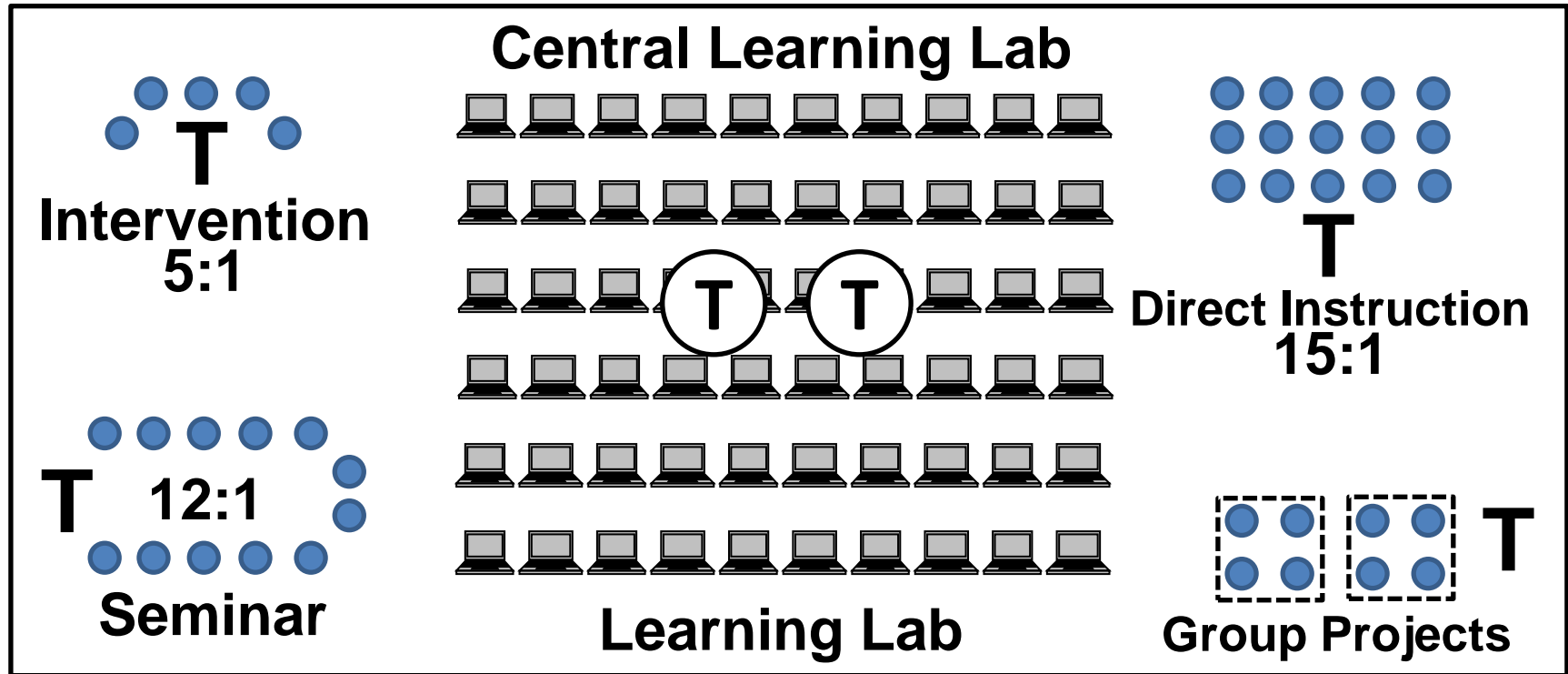
Lab-rotation model: Rocketship Education



Teacher (T)
Paraprofessional (P)



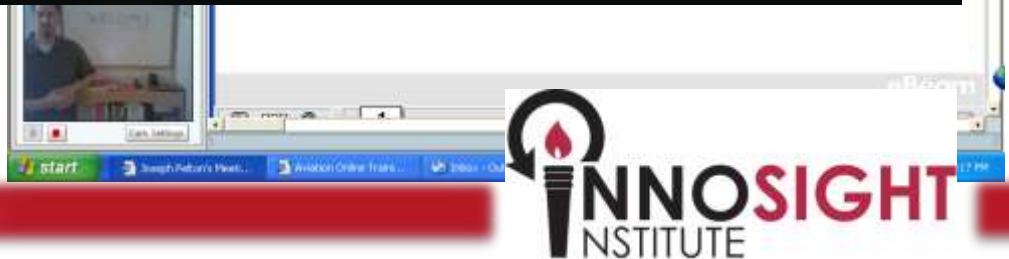
Individual-rotation model: Carpe Diem



273 students
6 teachers (T)



Technology predictably improves



Built to standardize



Different learning needs @ different times

Multiple intelligences

Learning Styles

Talents

Motivations/interests

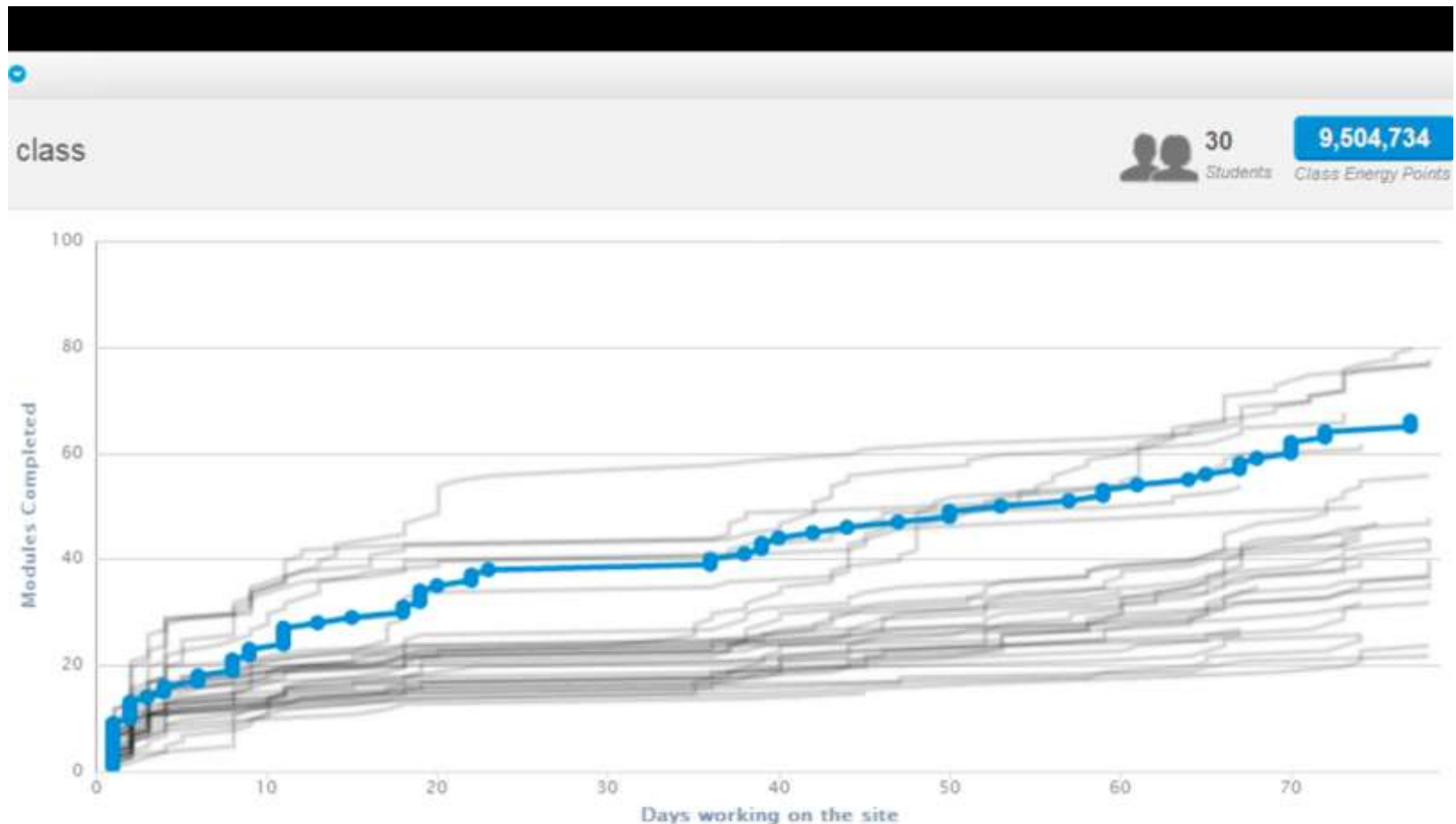
Aptitude

Depends on subject/domain

Different paces

Ongoing neuroscience research

Students don't learn at constant rates



Fixed time, variable learning



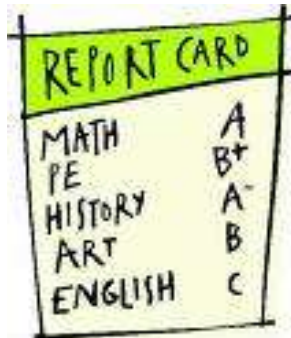
Deliver content to students



Testing & assessment



Progress to next grade, subject,
or body of material

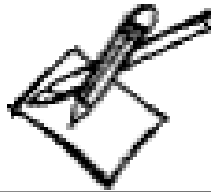


Receive results

Competency-based learning



Students engage in learning opportunities



Testing & assessment



Receive real-time interactive feedback



Progress to next unit or body of material

Practical implications

- Begin at the end. Define outcomes.
- Make technology the slave to your strategy, not the other way around.
- Harness the power of time, place, path, and pace for student personalization.
- Personalize for your circumstances too. Think in terms of “SWOT.”
- Take advantage of rapidly improving content and communication tools.
- Shift to outcome accountability, not input-based rules.

Practical implications

- Not beholden by the old metrics
 - Seat time → Competency-based
 - Geographic boundaries
 - Teacher certifications
 - In general, move beyond focus on inputs/processes
- Self-sustaining funding
- Autonomous
- Human resources pipeline & PD
- Broadband/wireless infrastructure
- Portal/Based on usage and what works
- Treatment and use of data

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Education technology categories



Curricula

→ Digital content including: online courses, test prep, tutoring, specialized providers, and edu-games.



Instructional Systems

→ Classroom learning and academic solutions including: learning management systems, assessment systems, gradebooks, sharing and collaboration tools, and social learning systems.



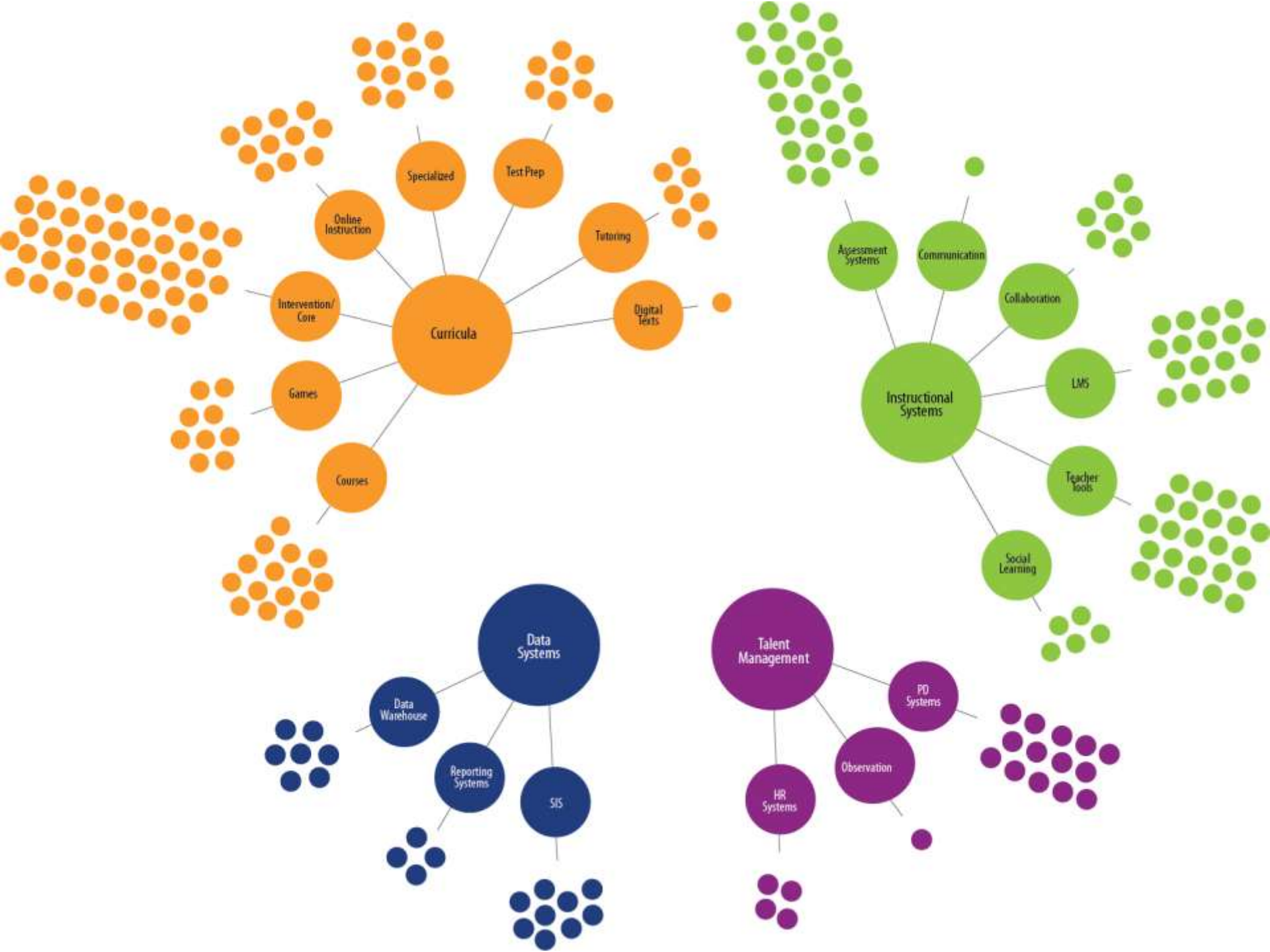
Data

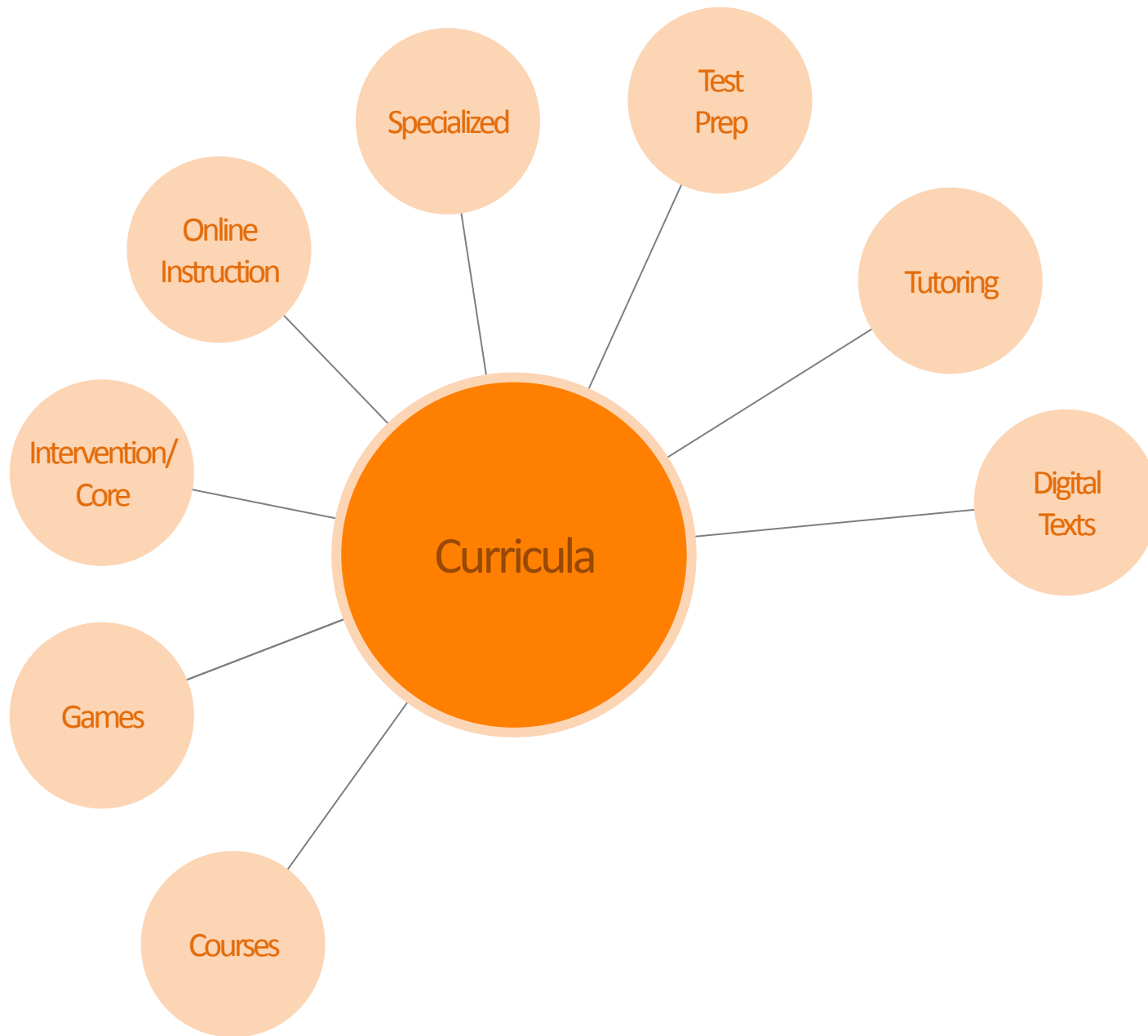
→ Systems which manage student demographics, achievement scores, and provide analytics and reporting.

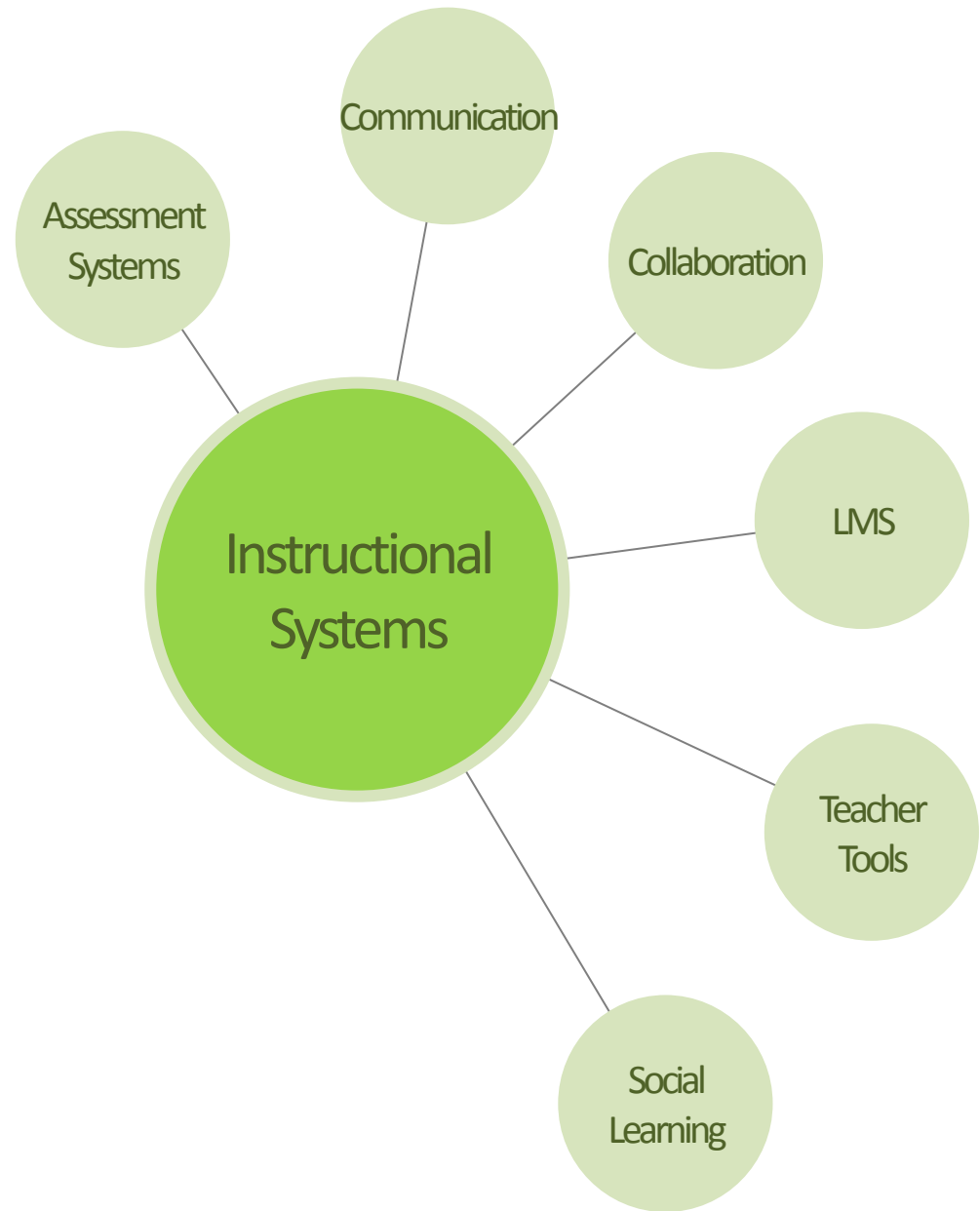


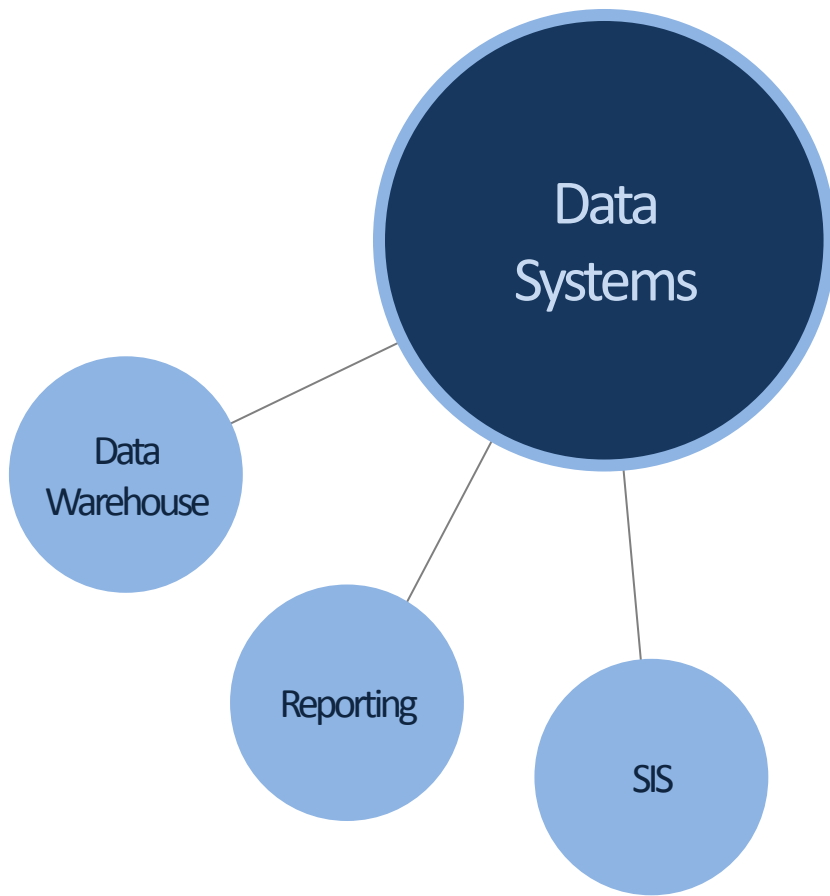
Talent Management

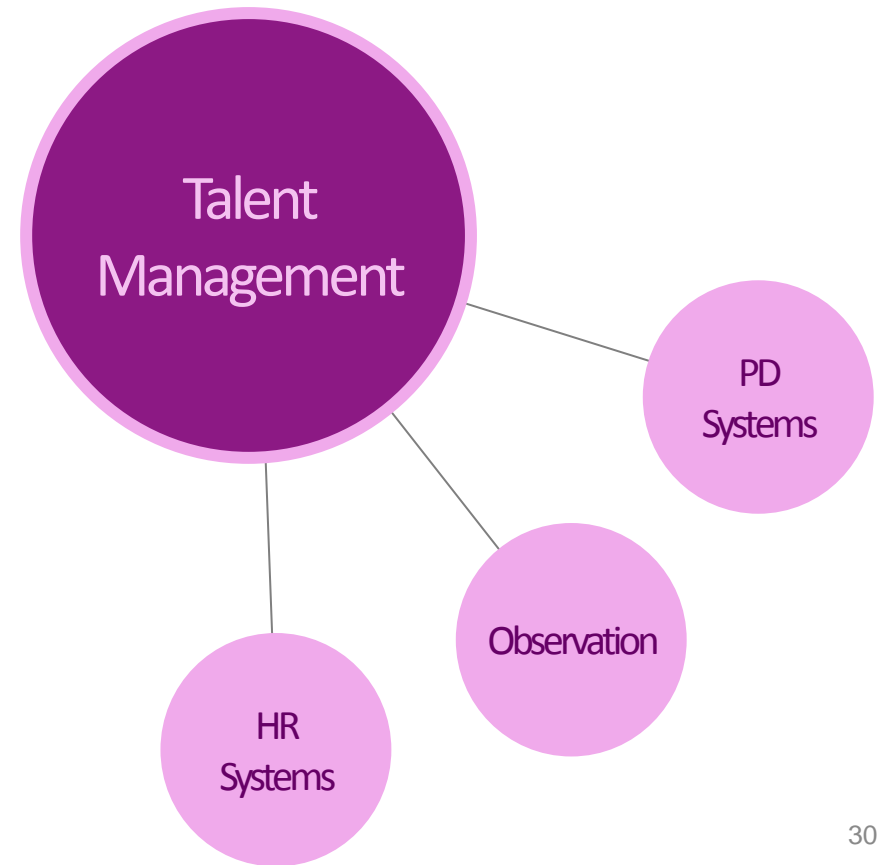
→ Applications which support professional development and teacher effectiveness as well as human resource systems.



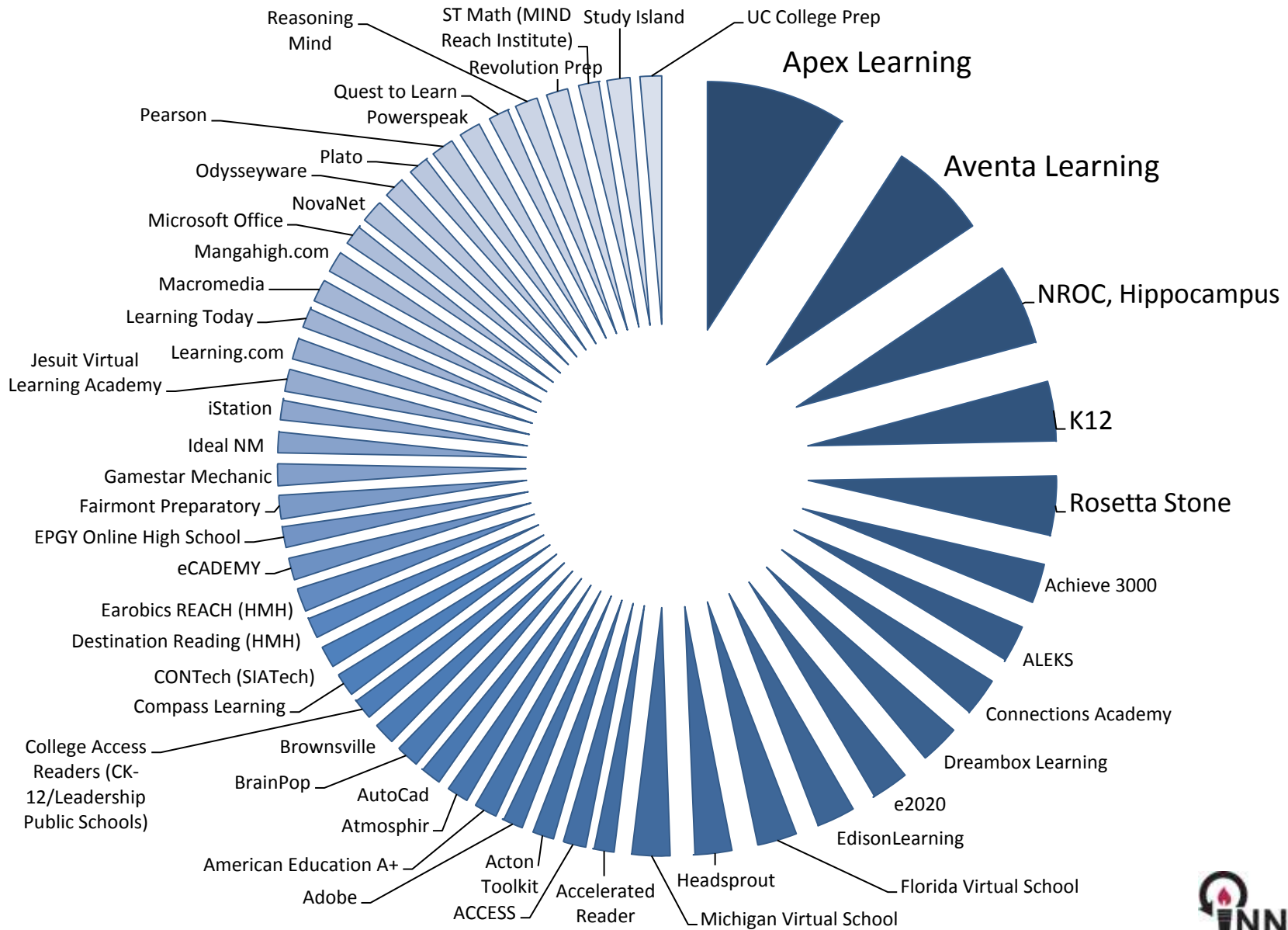








Proliferation of content options



You're on this lesson

Biology II

- 1. Viruses, Bacteria, Protists, and Fungi
 - 1. Viruses
 - 2. Archaeobacteria and Eubacteria
 - 3. The World of Protists
 - 4. Algae: Part I: Prokaryotes
 - 5. Green Algae, Slime Molds, and Dewey Molds
 - 6. What is a Fungus?
 - 7. The Diversity of Fungi
 - 8. Unit Review
 - 9. Unit Test
 - 10. Virtual Microscope Lab
- 2. Plants
 - 1. Adapting to Life on Land
 - 2. Survey of the Plant Kingdom
 - 3. Nonvascular Plants
 - 4. Vascular Plants
 - 5. Seed Plants
 - 6. Lab: Researching Trees on the Internet
 - 7. Plant Cells and Tissues
 - 8. Roots, Stems, and Leaves
 - 9. Plant Reproduction
 - 10. Life Cycles of Mosses, Ferns, and Conifers
 - 11. Flowers and Flowering
 - 12. The Life Cycle of a Flowering Plant
 - 13. Unit Review
 - 14. Unit Test
- 3. Invertebrates
 - 1. Typical Animal Characteristics
 - 2. Body Plans and Adaptations
 - 3. Sponges
 - 4. Cnidarians
 - 5. Flatworms
 - 6. Roundworms
 - 7. Mollusks
 - 8. Segmented Worms
 - 9. Characteristics of Arthropods
 - 10. Diversity of Arthropods
 - 11. Echinoderms
 - 12. Unit Review
 - 13. Unit Test
 - 14. Virtual Shark Dissection Lab
- 4. Vertebrates
 - 1. Fishes
 - 2. Amphibians
 - 3. Reptiles
 - 4. Birds

Virtual Microscope Lab

Biology B Unit 1: Viruses, Bacteria, Protists, and Fungi

Getting Started | Instructions | Activities | Assessment

Scientists frequently use a **compound light microscope** in a microbiology laboratory. A compound microscope uses a combination of lens systems: the **objective scanning lens system** and the eyepiece or **ocular lens system**.

Other parts of the microscope include **coarse focus** and **fine focus knobs**, the **iris diaphragm**, and **xy controls**.

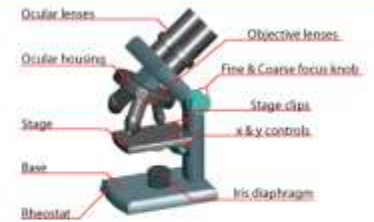
In this lesson, you will learn how to use each of these features and others as you use the UD Virtual Compound Microscope (created by the University of Delaware) to view various specimens.

Print this page so that you can refer to the labeled diagram of the microscope at any time.

You have two days to complete this lesson.

Objectives:

- Use a compound microscope view specimens under different magnifications
- Use a compound microscope to measure specimens



—Biology—
Virtual Microscope Lab

Anatomy and Physiology
(Sept 7 - 13)

Week 2 - Cellular Structure
and Function (Sept 14 - 20)

Week 3 - Examining Cells
and Tissues (Sept 21 - 27)

Week 4 - Organ Systems
and the Integumentary
System (Sept 28 - Oct 4)

Week 5 - The Skeletal
System (Oct 5 - 11)

[5-0 Week 5 Overview](#)

[5-1 Introducing the Skeletal System](#)

[5-2 Skeletal System Anatomy](#)

[5-3 Skeletal System Physiology: Building Bone](#)

[5-4 Hands On: A "Joint" Venture](#)

[5-5 ImageJ Lab: Looking at Bones](#)

[5-6 Breaking News: the Skeletal System](#)

Week 6 - The Muscular
System (Oct 12 - 18)

Week 7 - The Respiratory
System (Oct 19 - 25)

Week 8 - The Circulatory
System (Oct 26 - Nov 1)

5-4 Hands On: A "Joint" Venture

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Building a Joint

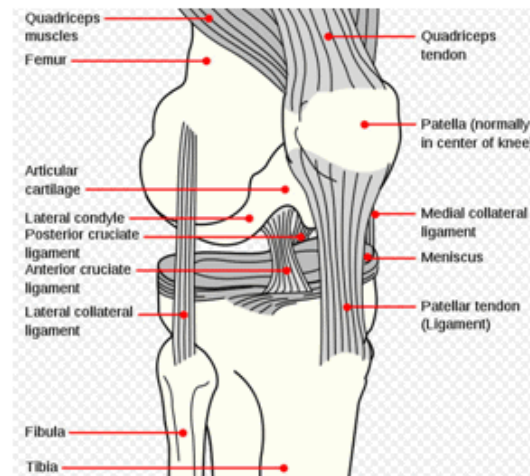
Joints are the junctions between bones. As you can see in the diagram above, joints consist of much more than just bone. In fact, muscle, cartilage, tendons and ligaments all play key roles in the structure and function of a joints.

Joints can be classified by there structure as well as by their function. Joints between bones run a spectrum from immobile to fully mobile.

Synarthrosis joints are allow little mobility and are mostly fibrous. For example, the joints in the skull (called "sutures") are synarthrosis joints.

Amphiarthrosis joints allow some movement and are usually composed of cartilage. This type of joint is found between the vertebrae in the spinal column.

Diarthrosis or **synovial** joints allow extended mobility. Structurally, these joints have a fibrous capsule, articular cartilage and synovial fluid. Man of the joints you think of, such as your elbow, knee, shoulder and hip are synovial joints. There are six types of diarthrosis joints based on range of mobility: ball and socket, condyloid, saddle, pivot, hinge and gliding.



Structure of the Knee

In this activity, you will choose one of the six types of diarthrosis joints to model and share you model with your classmates.

Objectives:

- To distinguish among the different types of joints
- To build a particular type of joint that demonstrates accurate structure and mobility

Cartilaginous Joint

[Edit](#) | [Delete](#) | [History](#)Posted by Tags: None [\(Edit\)](#)

This is an example of a Cartilaginous Joint—but an intervertebral disc to be specific.

To make this joint, I used modeling clay. The orange represents the vertebrates, and the yellow represents the intervertebral discs that separate each vertebrae in the spine.

Each disc is a cartilaginous joint that allows for slight movement between the vertebrates. The discs also act as a ligament that holds all the vertebrae together in the spine.

You would find this specific joint (the intervertebral disc) in the spine, but you can find cartilaginous joints in other places as well. Another example would be the joint connecting the manubrium (chest) and sternum.

Viewer Comments (1)



Cartilagenous Joint

Made by [Edit](#) | [Delete](#)

I had doubts that anyone would pick this sort of joint, because I imagined it would be rather difficult to recreate. You, however, did a splendid job! I love that you used bright color in your model, as it really helped to differentiate between the disks and their cartilagenous joints. I wonder how people strain their backs so much with these joints. After all, they don't seem like they would allow for much movement.

Billy

$4+4 = 2+2+4+1$

HINT

TRUE

4 4 2

Bert

0 1 2 3 4

50

68 70 120 122

50

2 2

68 70 120 122

Billy

$68+54 = 122$

DONE

68 70 120 122

50

2 2

68 70 120 122

STOP







